

**NDEQ Permit Application
for a Livestock Waste Control Facility
for Case Study Swine Farm.**

Components:

1. Engineering Component
 - Structure sizing issues
 - Seepage issues
 - Site and engineering drawings

2. Nutrient Management and Land Application Component
 - *Inventory* of herd size, land application sites, and land application equipment
 - *Strategic plan* for land requirements, off-farm land application of manure, and emergency response plan.
 - *Annual plan* for manure application, manure analysis, soil analysis, manure credit calculation, and nitrogen planning
 - *Documentation and records*: Sample record keeping forms to be maintained

3. Manure storage management plan component
 - *Inventory* of existing manure storage/treatment facilities and manure/effluent handling equipment (e.g. pumping, loading, agitation, and transport equipment)
 - *Strategic plan* for manure production, manure storage operation and maintenance, sludge management (lagoons and open lot runoff systems), closure, and emergency response plan.
 - *Documentation and records*: Sample record keeping forms to be maintained

4. Odor management plan component (Livestock operations > 1000 a.u.)
 - *Inventory*: Assessment of odor nuisance risks and site drawings of rural neighborhood
 - *Strategic Plan*: Identification of current and planned odor management practices and technologies.
 - *Documentation and records*: Sample record keeping forms to be maintained about complaints, communications with neighbors, etc.

**NDEQ Permit Application
for a Livestock Waste Control Facility
for Case Study Swine Farm.**

Nutrient Management and Land Application Component

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- | | |
|---|----------|
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| 3) Land Application Equipment Inventory | Form A-6 |

Strategic (Long-Term) Plan

- | | |
|--|--|
| 1) Land Requirements for Nutrient Inventory | Spreadsheet Results Or Forms B-1, B-7, B-8, B-9 |
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- | | |
|--|-------------------|
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Documentation and Records Samples**

- | | |
|--|----------|
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* These blank forms illustrate the procedure to be followed for estimating manure application based upon nitrogen. These forms will be completed prior to each cropping season and maintained as part of the records documenting manure application rates.

** These blank forms illustrate are samples of the records to be kept as part of the documentation for the Nutrient Management and Land Application Plan.

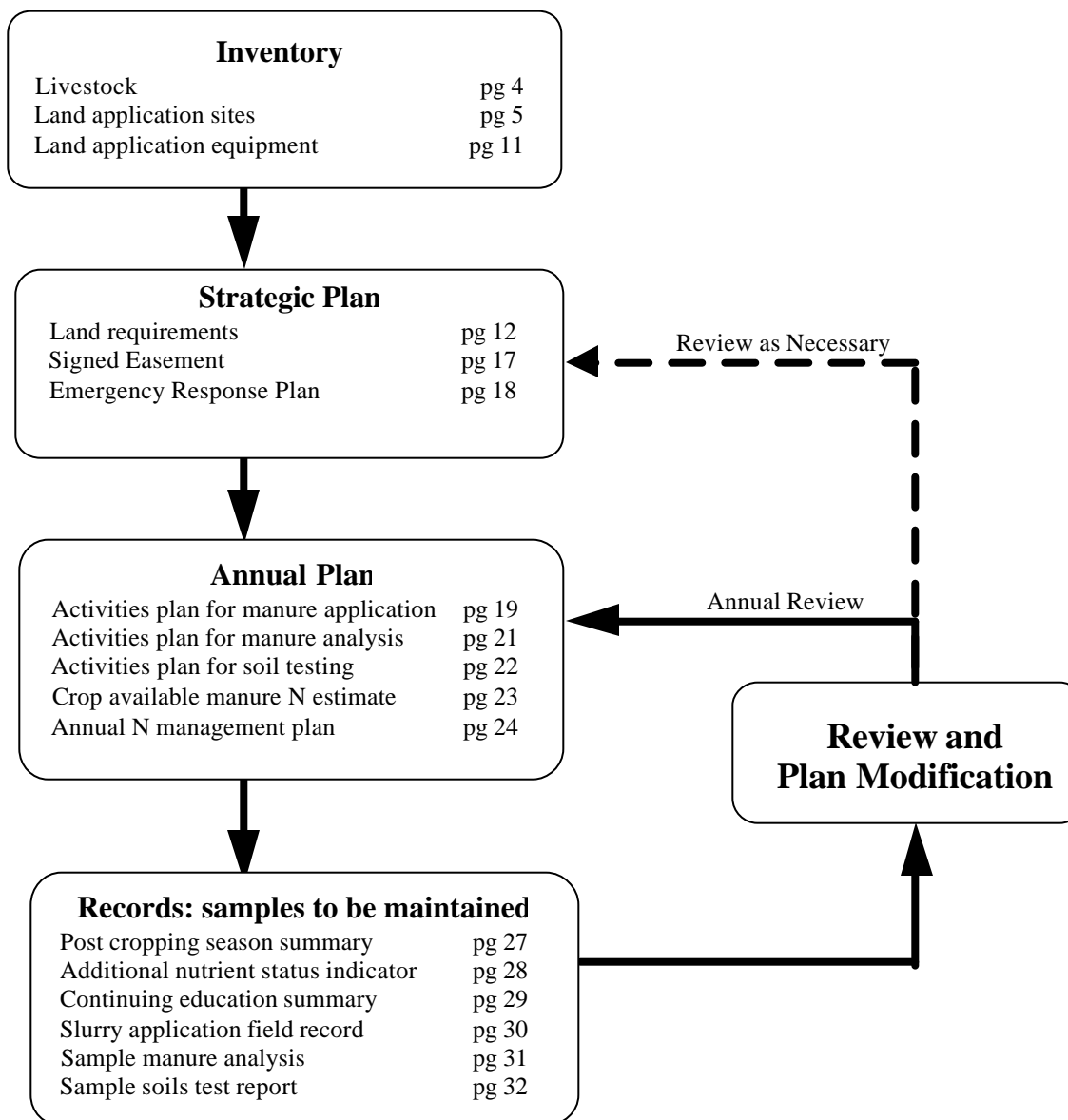
NDEQ Permit Application For a Livestock Waste Control Facility For Case Study Pork Farm

Nutrient Management and Land Application Component

Table of Contents

Introduction

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**Form I-3. Summary of Strategic Plan Recommendations**for the Case Study Pork Animal Feeding Operation*These pages are to be completed after completing the plan.***Part I. Manure Inventory Summary***Estimated Nutrient Excretion from Form B-1 or B-2 (or B-6).*

| <u>Manure Handling System</u> | <u>Nitrogen (lbs./year)</u> | <u>P₂O₅ (lbs./year)</u> |
|-------------------------------|---------------------------------|---|
| 1. Below Barn Pits | 91,200 | 79,000 |
| 2. _____ | _____ | _____ |
| 3. _____ | _____ | _____ |
| Totals | 91,200 | 79,000 |

Available Nutrients After All Losses in one year

| <u>Manure Handling System</u> | <u>Nitrogen¹ (lbs./year)</u> | <u>P₂O₅² (lbs./year)</u> | <u>Manure Quantity³ (tons or 1,000 gallons/yr.)</u> |
|-------------------------------|---|---|--|
| 1. Below Barn Pits | 77,500 | 79,000 | 2,400,000 |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| Totals | 77,500 | 79,000 | 2,400,000 |

1: From Form B-8 2: From Form B-7 3: From Form B-3, B-4, and/or B-5.

Land Requirements for Managing Nutrients

| | <u>For N Management⁴</u> | <u>For P Management⁵</u> | <u>For Sludge P Management⁶</u> |
|-----------------|-------------------------------------|-------------------------------------|--|
| | | Annual | After _____ years |
| Crop 1: Corn | 470 acres | 1420 acres | --- Acres |
| Crop 2: Alfalfa | 45 acres | 45 acres | --- acres |
| Crop 3: _____ | _____ acres | _____ acres | _____ acres |
| Crop 4: _____ | _____ acres | _____ acres | _____ acres |
| Crop 5: _____ | _____ acres | _____ acres | _____ acres |
| Crop 6: _____ | _____ acres | _____ acres | _____ Acres |
| Totals: | 515 acres | 1465 acres | _____ acres |

4: From Form B-9, col. c. 5: From Form B-10, col. c. 6: From Form B-11, col. c.

II. Action Plan Summary

For each plan explained in the Strategic Plan list the key activities associated with the plan. For example there will always be a CNMP and there might be a manure transfer plan, sludge and sediment plan, closure plan, emergency response plan and an odor management plan. Copy the next page for as many plans as needed:



Form I-3. Summary of Strategic Plan Recommendations

Part II. Management Plan Summaries

- The* *Land Requirements* *Management Plan: Summary of Key Recommendations*
- 210 of additional crop land is required beyond land owned by Case Study Pork. 240 acres of neighbor's crop land will be accessible based upon signed agreements that are attached (page 17).
- The* *Emergency Response* *Management Plan: Summary of Key Recommendations*
- An emergency response plan is attached (page 18) for control of a manure spill resulting from 1) and overturn of a 4,000 gallon slurry tank or 2) overfilling of the slurry tank during storage pump-out. A supply of dirt and a skid steer loader is maintained for creating a berm around any spill. A neighbor's vacuum tank wagon is available for reloading spilled manure if necessary.
 - Contact information and procedures for the farm owner, NDEQ, and the county sheriff are contained within the plan.



Form I-4. Comprehensive Nutrient Management Plan Summary of Annual Plan Recommendations

for the Case Study Pork Animal Feeding Operation

(attach copy of Action Plan from Annual Plan Section)

Summary of Manure Application Rates (see attached Action Plan)

Rates of 6,000 gallons per acres will commonly be used based upon current manure and soils analysis. These rates will be adjusted annually as additional manure analysis history and individual years soils reports become available (see pages A and 24-27)

Manure Nutrient Analysis Recommendations

Manure analysis will be collected from one building's deep pit each spring and fall. The sample will represent a composite of 8 samples taken at different depths. Of a deep pit as it is being agitated and pumped out. All samples will be taken during land application and used to adjust fertilizer applications during irrigation or next year's manure application rate (see page 21).

Summary of Application Method and Timing (see attached Action Plan)

Manure will be applied with one of two 4,000 gallon slurry tanks during the early spring and late fall. Manure will be incorporated on row crop land and surface applied on alfalfa (see page 19).

Soil Testing/Crop Nutrient Status Recommendations

Soil Testing will include 10 fall deep soil sampling for residual nitrates (three samples between 0 and 48") and soil phosphorus (summer "soil sample only" and 2) spring PSNT soil testing. Irrigation well will be sampled for nitrates annually and stalk nitrate testing will also be implemented (see page 22).

Erosion and Runoff Control Recommendations

An NRCS conservation plan is in place which includes minimum tillage management of row crop land and a grassed waterway in one drainage area (see page 10).



Form A-1. Livestock and Poultry Inventory for Meat Production

Inventory of animals (in confinement housing or open lots) fed for meat production, replacements, or reproduction.

Column headings in italics are required for the NDEQ permit application.

| a. Species and Group | b. Describe Confinement & Location | c. Maximum & Average One-Time Population | Average Weight (lbs.) | | f. Average Days on Feed | g. Turns per Year | Daily Feed Intake | | Feed Composition ¹ | | | | n. Fat Free Lean Index ² |
|----------------------|------------------------------------|--|-----------------------|--------|-------------------------|-------------------|---------------------------------|--|-------------------------------|--------|-------|--|-------------------------------------|
| | | | d. Begin | e. End | | | h. Feed (lbs./day) ¹ | i. Moisture Basis | j. % CP | k. % P | l. %K | m. Moisture Basis | |
| Example: Pigs/Finish | Slatted floor barn...Barn 1 | 1,000 975 | 45 | 250 | 110 days | 3 | 5,350 lbs. | <input checked="" type="checkbox"/> As Fed <input type="checkbox"/> Dry | 17% | 0.6% | 1% | <input checked="" type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 1. Growth/Finish | Slatted floor barn with deep pits | 4,000 4,000 | 60 | 260 | 111 days | 3 | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 2. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 3. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 4. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 5. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 6. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 7. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 8. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 9. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |
| 10. | | | | | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | | | | <input type="checkbox"/> As Fed <input type="checkbox"/> Dry | |

1. Both daily feed intake and feed composition should be measured on the same moisture basis (e.g. both on an "As Fed" basis).

2. Fat Free Lean Index is needed only for pork finishers only. This measure should be available for market hogs at the time of slaughter.



Form A-4 (part 1). Inventory of Land Application Sites for Manure Application

Field ID: Pivot #1 **Field Size:** 130 useable acres

NW 16 27 4 ☐ X Pierce

Location $\frac{1}{4}$ Section Township Range E or W County

Other Manure Sources: Is livestock waste from another facility applied to this site? ☐ YES ☒ NO
If yes, attach waste production information from the other facility.

Ownership: ☒ Own ☐ Rent ☐ Neighbor **Is there an easement ?** ☐ YES ☒ NO

If "Rent" or "Neighbor" is checked, list name and address of land owner:

Name(s) Address(es)

Availability for manure application: Between harvest and planting; no restrictions

Cropping Practices: Planned rotation: Corn continuous

Five year average yields: 170 bu/ac

Source of yield values: ☒ FSA verified yields or other

Environmental Considerations:

Is there a USDA approved conservation plan for this site? ☒ YES ☐ NO

| Soil Type: | Series & texture | Slope (avg.) | Soil Phosphorus Levels | | | |
|---|---|--------------|--|--------------|----------------|----------------|
| Primary Soil: | <u>Ortello f.s.1</u> | <u>0-7</u> % | Management Area Soil Test | | | |
| Secondary Soil: | <u>Bazile loam</u> | <u>0-1</u> % | Name/ID | Acres | P (ppm) | Method* |
| Irrigated <input type="checkbox"/> | <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> | <u>130</u> | <u>OcR soils</u> | <u>60</u> | <u>152</u> | <u>Bray</u> |
| No | Flood | Sprinkler | <u>ThC soils</u> | <u>20</u> | <u>177</u> | <u>Bray</u> |
| | | Acres | <u>BoA/soils</u> | <u>30</u> | <u>886</u> | <u>Ray</u> |
| | | | <u>BdA soils</u> | <u>20</u> | <u>121</u> | <u>Bray</u> |
| | | | | | | |
| | | | | | | |
| Depth to groundwater: <u>55 feet</u> | | | Sample Depth <u>8</u> inches | | | |
| Distance to Nearest Body of Water <u>>3000 feet</u> | | | * B = Bray (P1, weak acid); M = Mehlich III; O = Olsen (sodium bicarbonate). Write in test name if not one of these. | | | |
| Does field contain: YES NO | | | | | | |
| Highly Erodible Land? <input type="checkbox"/> <input checked="" type="checkbox"/> | | | | | | |
| Perennial Stream? <input type="checkbox"/> <input checked="" type="checkbox"/> | | | | | | |
| Intermittent Stream? <input type="checkbox"/> <input checked="" type="checkbox"/> | | | | | | |
| Concentrated Flow? <input checked="" type="checkbox"/> <input type="checkbox"/> | | | | | | |
| Flooding/Overflow Potential? <input type="checkbox"/> <input checked="" type="checkbox"/> | | | | | | |
| Designated Wetlands? <input type="checkbox"/> <input checked="" type="checkbox"/> | | | | | | |
| Acres of wetlands: <u>0</u> acres. | | | | | | |
| Other _____ | | | | | | |



Form A-4 (part 1). Inventory of Land Application Sites for Manure Application

Field ID: Pivot #2 Field Size: 130 useable acres

Location NE 16 27 4 ☐ X Pierce

Location 1/4 Section Township Range E or W County

Other Manure Sources: Is livestock waste from another facility applied to this site? ☐ YES ☒ NO
If yes, attach waste production information from the other facility.

Ownership: ☒ Own ☐ Rent ☐ Neighbor **Is there an easement ?** ☐ YES ☒ NO
If "Rent" or "Neighbor" is checked, list name and address of land owner:

Name(s) _____ Address(es) _____

Availability for manure application: Between harvest and planting; no restrictions

Cropping Practices: Planned rotation: Corn continuous

Five year average yields: 170 bu/ac

Source of yield values: ☒ FSA verified yields or other

Environmental Considerations:

Is there a USDA approved conservation plan for this site? ☒ YES ☐ NO

| Soil Type: | Series & texture | Slope (avg.) | Soil Phosphorus Levels | | | |
|--|-----------------------------------|--------------|---|--------------|----------------|----------------|
| Primary Soil: | <u>Bazile loam</u> | <u>0-1</u> % | Management Area Soil Test | | | |
| Secondary Soil: | <u>Colo Silt loam</u> | <u>0-1</u> % | Name/ID | Acres | P (ppm) | Method* |
| Irrigated <input type="checkbox"/> | <input type="checkbox"/> <u>X</u> | <u>130</u> | <u>NE</u> | <u>33</u> | <u>9</u> | <u>Bray</u> |
| No <input type="checkbox"/> | <u>Flood</u> <u>Sprinkler</u> | <u>Acres</u> | <u>NW</u> | <u>33</u> | <u>4</u> | <u>Bray</u> |
| Depth to groundwater: <u>55 feet</u> | | | <u>SE</u> | <u>33</u> | <u>19</u> | <u>Bray</u> |
| Distance to Nearest Body of Water <u>>2600 feet</u> | | | <u>SW</u> | <u>33</u> | <u>3</u> | <u>Bray</u> |
| Does field contain: YES NO | | | | | | |
| Highly Erodible Land? <input type="checkbox"/> <u>X</u> | | | | | | |
| Perennial Stream? <input type="checkbox"/> <u>X</u> | | | | | | |
| Intermittent Stream? <input type="checkbox"/> <u>X</u> | | | | | | |
| Concentrated Flow? <u>X</u> <input type="checkbox"/> | | | | | | |
| Flooding/Overflow Potential? <input type="checkbox"/> <u>X</u> | | | | | | |
| Designated Wetlands? <input type="checkbox"/> <u>X</u> | | | | | | |
| Acres of wetlands: <u>0</u> acres. | | | | | | |
| Other _____ | | | | | | |



Form A-4 (part 1). Inventory of Land Application Sites for Manure Application

Field ID: Pivot CornersField Size: 45 useable acres

| | | | | | | |
|----------|--------------|-----------|-----------|----------|-----------------------------------|---------------|
| | <u>NE/NW</u> | <u>16</u> | <u>27</u> | <u>4</u> | <input type="checkbox"/> <u>X</u> | <u>Pierce</u> |
| Location | ¼ | Section | Township | Range | E or W | County |
| n | | | | | | |

Other Manure Sources: Is livestock waste from another facility applied to this site? ☐ YES ☒ NO
If yes, attach waste production information from the other facility.

Ownership: ☒ Own ☐ Rent ☐ Neighbor **Is there an easement ?** ☐ YES ☒ NO
If "Rent" or "Neighbor" is checked, list name and address of land owner:

Name(s)

Address(es)

Availability for manure application: Between harvest and planting; no restrictions

Cropping Practices: Planned rotation: Alfalfa continuous
Five year average yields: 3 tons/acre (Table 5, p.25) Will use 1-5 t/acre to get the correct removal rate
Source of yield values: ☒ FSA verified yields ☐ or other _____

Environmental Considerations:

Is there a USDA approved conservation plan for this site? ☒ YES ☐ NO

| Soil Type: | Series & texture | Slope (avg.) | Soil Phosphorus Levels | | | |
|--|-----------------------------------|---------------|------------------------|-----------|-----------|-------------|
| | | | Management Area | | Soil Test | |
| | | | Name/ID | Acres | P (ppm) | Method* |
| Primary Soil: | <u>Ortello f.s.1</u> | <u>2-7</u> % | <u>Corners</u> | <u>45</u> | <u>53</u> | <u>Bray</u> |
| Secondary Soil: | <u>Colo Silt Loam</u> | <u>0-1</u> % | | | | <u>Bray</u> |
| Irrigated <input type="checkbox"/> | <input type="checkbox"/> <u>X</u> | <u>45</u> | | | | <u>Bray</u> |
| No | Flood Sprinkler | Acres | | | | <u>Bray</u> |
| Depth to groundwater: <u>55 feet</u> | | | | | | <u>Bray</u> |
| Distance to Nearest Body of Water <u>>2600 feet</u> | | | | | | <u>Bray</u> |
| Does field contain: | | | | | | |
| | | YES NO | | | | |
| Highly Erodible Land? | <input type="checkbox"/> | <u>X</u> | | | | |
| Perennial Stream? | <input type="checkbox"/> | <u>X</u> | | | | |
| Intermittent Stream? | <input type="checkbox"/> | <u>X</u> | | | | |
| Concentrated Flow? | <input type="checkbox"/> | <u>X</u> | | | | |
| Flooding/Overflow Potential? | <input type="checkbox"/> | <u>X</u> | | | | |
| Designated Wetlands? | <input type="checkbox"/> | <u>X</u> | | | | |
| Acres of wetlands: <u>0</u> acres. | | | | | | |
| Other _____ | | | | | | |



Case Study June 2001

Form A-4 (part 1). Inventory of Land Application Sites for Manure Application

Field ID: Neighbor 80 **Field Size:** 80 useable acres

S $\frac{1}{2}$ **SE** **9** **27** **4** ☐ **X** **Pierce**
 Location $\frac{1}{4}$ Section Township Range E or W County

Other Manure Sources: Is livestock waste from another facility applied to this site? ☐ YES ☒ NO
 If yes, attach waste production information from the other facility.

Ownership: ☐ Own ☐ Rent ☒ Neighbor **Is there an easement?** ☒ YES ☐ NO
 If "Rent" or "Neighbor" is checked, list name and address of land owner:

John Neighbor RR1 Plainview

Name(s) Address(es)

Availability for manure application: Between harvest and planintg; no restrictions

Cropping Practices: Planned rotation: Corn continuous
 Five year average yields: 115 bu/ac
 Source of yield values: ☒ FSA verified yields ☐ or other

Environmental Considerations:

Is there a USDA approved conservation plan for this site? ☒ YES ☐ NO

| Soil Type: | Series & texture | Slope (avg.) | Soil Phosphorus Levels | | | |
|---|--------------------------|--------------|--|--------------|----------------|----------------|
| Primary Soil: | <u>Lawet Loam</u> | <u>0-1</u> % | Management Area Soil Test | | | |
| Secondary Soil: | <u>Orwet Loam</u> | <u>0-1</u> % | Name/ID | Acres | P (ppm) | Method* |
| Irrigated <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>80</u> | <u>North</u> | <u>40</u> | <u>12</u> | <u>Bray</u> |
| No <input type="checkbox"/> | <input type="checkbox"/> | Acres | <u>South</u> | <u>40</u> | <u>6</u> | <u>Bray</u> |
| | | | | | <u>4</u> | <u>Olsen</u> |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Depth to groundwater: <u>55 feet</u> | | | Sample Depth <u>8</u> inches * B = Bray (PI, weak acid); M = Mehlich III; O = Olsen (sodium bicarbonate). Write in test name if not one of these. | | | |
| Distance to Nearest Body of Water <u>>900 feet</u> | | | | | | |
| Does field contain: YES NO | | | | | | |
| Highly Erodible Land? <input type="checkbox"/> X | | | | | | |
| Perennial Stream? <input type="checkbox"/> X | | | | | | |
| Intermittent Stream? <input type="checkbox"/> X | | | | | | |
| Concentrated Flow? <input checked="" type="checkbox"/> <input type="checkbox"/> | | | | | | |
| Flooding/Overflow Potential? <input type="checkbox"/> X | | | | | | |
| Designated Wetlands? <input type="checkbox"/> X | | | | | | |
| Acres of wetlands: <u>0</u> acres. | | | | | | |
| Other <u></u> | | | | | | |



Form A-4 (part 1). Inventory of Land Application Sites for Manure Application

Field ID: Neighbor 1/4 Section **Field Size:** 145 useable acres

SW 9 27 4 ☐ X Pierce

Location 1/4 Section Township Range E or W County

Other Manure Sources: Is livestock waste from another facility applied to this site? ☐ YES ☒ NO
If yes, attach waste production information from the other facility.

Ownership: ☐ Own ☐ Rent ☒ Neighbor **Is there an easement?** ☒ YES ☐ NO
If "Rent" or "Neighbor" is checked, list name and address of land owner:

John Neighbor RR 1 Plainview

Name(s) Address(es)

Availability for manure application: Between harvest and planting; no restrictions

Cropping Practices: Planned rotation: Corn continuous

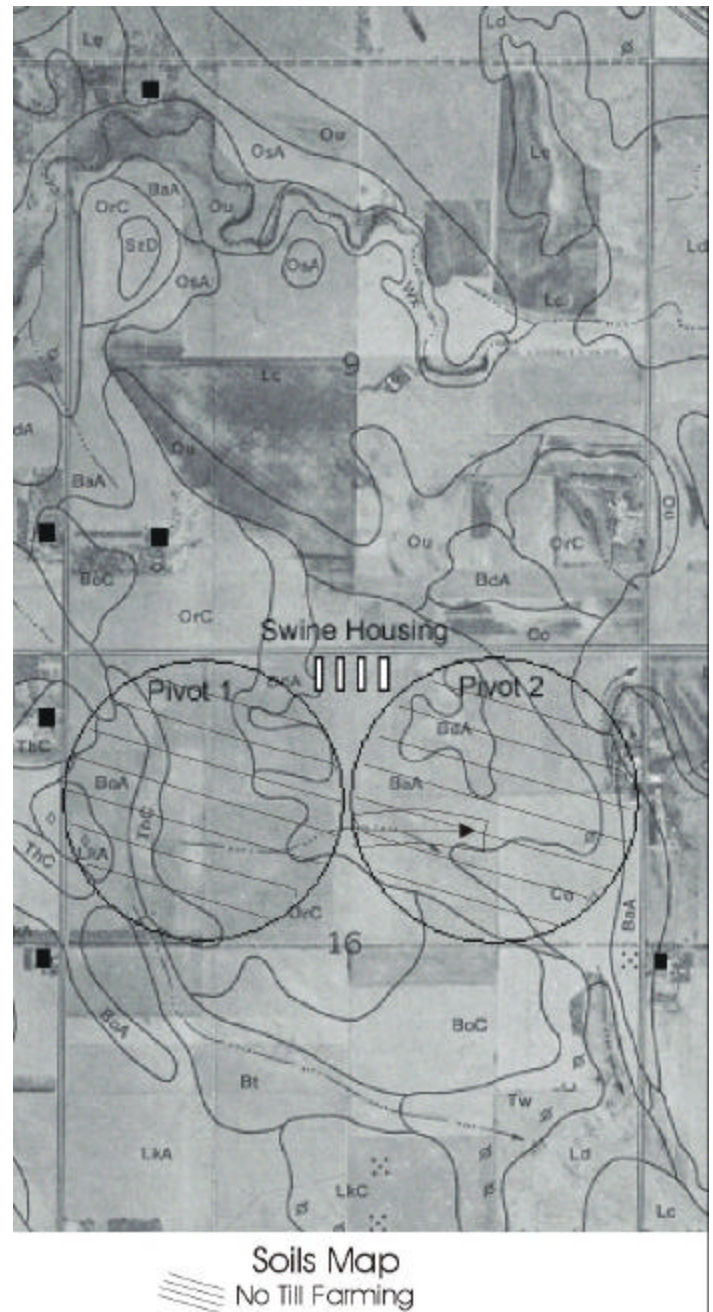
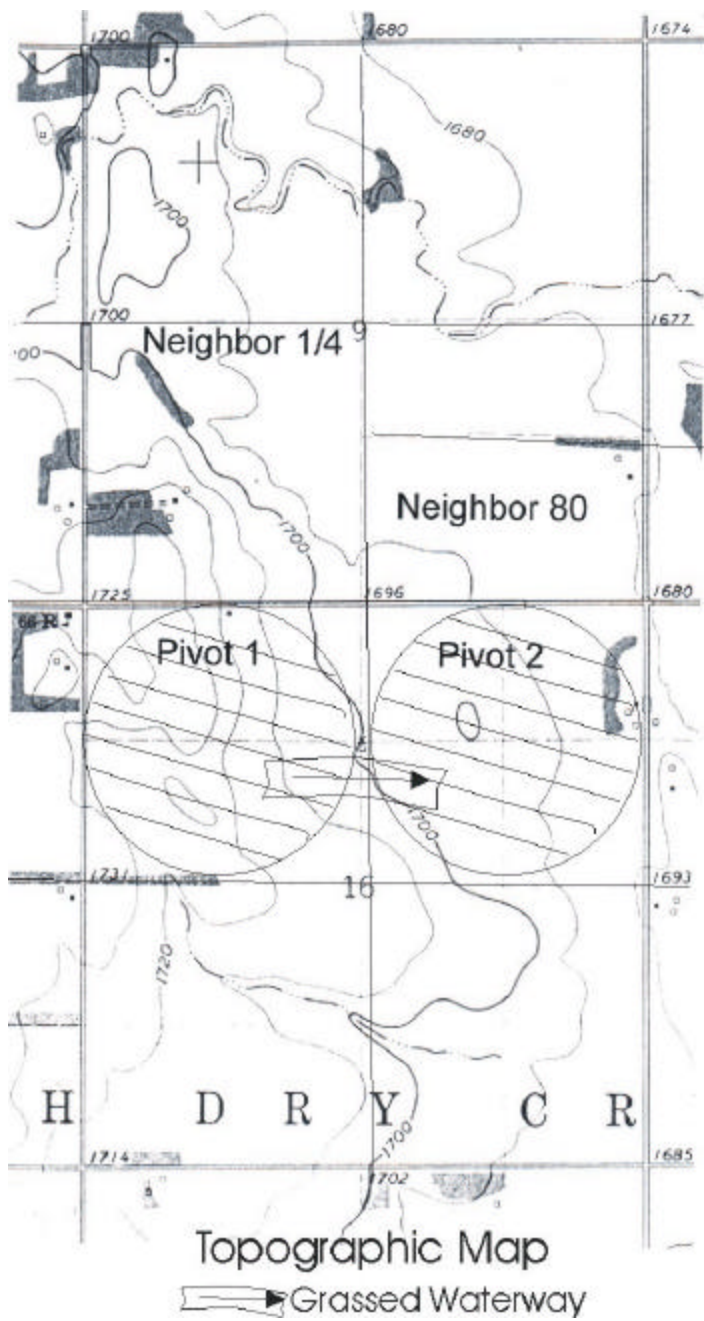
Five year average yields: 175 bu/ac

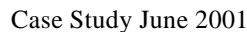
Source of yield values: ☒ FSA verified yields ☐ or other

Environmental Considerations:

Is there a USDA approved conservation plan for this site? ☒ YES ☐ NO

| Soil Type: | Series & texture | Slope (avg.) | Soil Phosphorus Levels | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|--------------|--|-----------------|-----------|---------|---------|-----------|-----------|----------|-------------|-----------|-----------|----------|-------------|-----------|-----------|----------|-------------|-----------|-----------|----------|-------------|--|--|--|--|--|--|--|--|
| Primary Soil: | <u>Lawet Loam</u> | <u>0-1</u> % | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Management Area</th> <th style="width: 20%;">Soil Test</th> <th style="width: 20%;">P (ppm)</th> <th style="width: 40%;">Method*</th> </tr> </thead> <tbody> <tr> <td><u>NE</u></td> <td><u>40</u></td> <td><u>9</u></td> <td><u>Bray</u></td> </tr> <tr> <td><u>NW</u></td> <td><u>40</u></td> <td><u>7</u></td> <td><u>Bray</u></td> </tr> <tr> <td><u>SE</u></td> <td><u>40</u></td> <td><u>4</u></td> <td><u>Bray</u></td> </tr> <tr> <td><u>SW</u></td> <td><u>25</u></td> <td><u>8</u></td> <td><u>Bray</u></td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>Sample Depth <u>8</u> inches</p> <p>* B = Bray (P1, weak acid); M = Mehlich III; O = Olsen (sodium bicarbonate). Write in test name if not one of these.</p> | Management Area | Soil Test | P (ppm) | Method* | <u>NE</u> | <u>40</u> | <u>9</u> | <u>Bray</u> | <u>NW</u> | <u>40</u> | <u>7</u> | <u>Bray</u> | <u>SE</u> | <u>40</u> | <u>4</u> | <u>Bray</u> | <u>SW</u> | <u>25</u> | <u>8</u> | <u>Bray</u> | | | | | | | | |
| Management Area | Soil Test | P (ppm) | | Method* | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>NE</u> | <u>40</u> | <u>9</u> | | <u>Bray</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>NW</u> | <u>40</u> | <u>7</u> | | <u>Bray</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>SE</u> | <u>40</u> | <u>4</u> | | <u>Bray</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>SW</u> | <u>25</u> | <u>8</u> | <u>Bray</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Secondary Soil: | <u>Orthllo f.s.1</u> | <u>2-7</u> % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Irrigated <input type="checkbox"/> | <input type="checkbox"/> <u>X</u> | <u>145</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No <input type="checkbox"/> | Flood <input type="checkbox"/> Sprinkler <input type="checkbox"/> | Acres | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth to groundwater: | <u>55 feet</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Distance to Nearest Body of Water | <u>>600 feet</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Does field contain: | YES NO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Highly Erodible Land? | <input type="checkbox"/> <u>X</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perennial Stream? | <input type="checkbox"/> <u>X</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intermittent Stream? | <input type="checkbox"/> <u>X</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Concentrated Flow? | <input type="checkbox"/> <u>X</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flooding/Overflow Potential? | <input type="checkbox"/> <u>X</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Designated Wetlands? | <input type="checkbox"/> <u>X</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acres of wetlands: | <u>0</u> acres. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |





Instruction for each piece of equipment used for application of manure or lagoon effluent (spreader, slurry tank, irrigation system, towed hose unit), please identify the information requested below.

Type of Equipment: Slurry Tank...check “ST”; Solids Spreader...check “SS”; Center Pivot...check “CP”; Other Sprinkler...check “OS”; Flood Irrigation...check “FI”; Towed Hose...check “TH”.

Ownership of Land Application Equipment: Owned by livestock operation...check "O"; Leased by livestock operation...check "L"; Custom Applicator... check "CA".

Fields Receiving Manure with This Equipment: List field numbers from previous section on Land Application Sites or “All” if equipment is used with all available fields.

| Equipment Description | Type of Equipment | Includes Incorporation Attachment? | Capacity | One Choose | Typical Daily Application Rate Check One | | Ownership of Land Application Equipment | Manure Storage System served by this equipment |
|-------------------------------|---|---|--------------|---|---|---------------|--|--|
| Example: Slurry Tank Spreader | <input checked="" type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | <u>3,000</u> | <input type="checkbox"/> tons/load <input checked="" type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input checked="" type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | <u>60,000</u> | <input checked="" type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | Swine finish, Deep pits |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
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| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day <input type="checkbox"/> acre-in./day | | <input type="checkbox"/> O <input type="checkbox"/> L <input type="checkbox"/> CA | |
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| | <input type="checkbox"/> ST <input type="checkbox"/> SS <input type="checkbox"/> CP <input type="checkbox"/> OS <input type="checkbox"/> FI <input type="checkbox"/> TH | <input type="checkbox"/> YES <input type="checkbox"/> NO | | <input type="checkbox"/> tons/load <input type="checkbox"/> gallons/min. <input type="checkbox"/> gallons/load | <input type="checkbox"/> tons/day <input type="checkbox"/> gallons/day | | | |

Summary of Nutrient Excretion, Nutrient Remaining After Storage and Field Losses, and Land Requirements For Agronomic Application

Producer's Name: Joe farmer Address: Rural Route 1 Phone: 402-999-0000
 Farm Name: Case Study Pork Address: Road 1239 Fax: 402-999-0001
 Town: Plainview, NE 68999 e-mail: jframer@farmmail.com
 Contact Person Who Completed Worksheet: Rick Koelsch Phone: 402-472-4051

| Herd/Flock Summary: | | Average Capacity | Average Weight | Portion of Year Facility Is Occupied | Method for Estimating Nutrient Excretion |
|---------------------|----------------------------|------------------|----------------|--------------------------------------|--|
| Species | and Group ID | | | | |
| Swine | Grower/Finisher (45+ lb..) | 4,000 | 160 | 95% | Book Value |
| | | | | | |
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| Nutrient Excretion by Livestock Summary | | | | | |
|--|------------------------|-------------|-------------------------------|--|----------------------------------|
| 1. Below Barn Pits | 91,200 | lbs. N/yr | 79,040 | lbs. P ₂ O ₅ /yr. | 60,800 lbs. K ₂ O/yr. |
| 2. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| 3. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| 4. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| Nutrients Remaining After Storage Losses | | | | | |
| 1. Below Barn Pits | 77,520 | lbs. N/yr | 79,040 | lbs. P ₂ O ₅ /yr. | 60,800 lbs. K ₂ O/yr. |
| 2. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| 3. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| 4. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| TOTAL | 77,520 | lbs. N/yr | 79,040 | lbs. P ₂ O ₅ /yr. | 60,800 lbs. K ₂ O/yr. |
| Nutrients Remaining After Field Application Losses (ammonia losses only) | | | | | |
| 1. Below Barn Pits | 73,644 | lbs. N/yr | 79,040 | lbs. P ₂ O ₅ /yr. | 60,800 lbs. K ₂ O/yr. |
| 2. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| 3. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| 4. | | lbs. N/yr | | lbs. P ₂ O ₅ /yr. | lbs. K ₂ O/yr. |
| TOTAL | 73,644 | lbs. N/yr | 79,040 | lbs. P ₂ O ₅ /yr. | 60,800 lbs. K ₂ O/yr. |
| Manure Nutrient Application Rate Assuming That Manure is Distributed Evenly Over Existing Land Base (Appl. Rate worksheet) | | | | | |
| 1. Below Barn Pits | 0 ac | lbs. N/acre | | lbs. P ₂ O ₅ /acre | lbs. K ₂ O/ac. |
| 2. | | lbs. N/acre | | lbs. P ₂ O ₅ /acre | lbs. K ₂ O/ac. |
| 3. | | lbs. N/acre | | lbs. P ₂ O ₅ /acre | lbs. K ₂ O/ac. |
| 4. | | lbs. N/acre | | lbs. P ₂ O ₅ /acre | lbs. K ₂ O/ac. |
| Crop Land Requirements if Manure Nutrients are Distributed According to Crop Nutrient Removal Rates (Land Base worksheet). | | | | | |
| Land Base Identified | Nitrogen | | P ₂ O ₅ | | K ₂ O |
| | Available | Utilized | Available | Utilized | Utilized |
| 1,480 ac | 73,644 lb | 73,644 lb | 79,040 lb | 79,040 lb | 60,800 lb |
| | 530 acres to utilize N | | 1,480 acres to utilize P | | 1,480 acres to utilize K |
| Crop Land Requirements for Accumulated Phosphorus in Settled Solids and Sludge of an Anaerobic Lagoon | | | | | |
| Land Base Identified | | | P ₂ O ₅ | | |
| | | | Available | Utilized | Remaining |
| 0 ac | | | 0 lb | 0 lb | 0 lb |
| | | | 0 acres to utilize P | | |

Table 1a. Book Value Estimate of Total Manure Nutrients Produced by Livestock

| Livestock or Poultry Species | Manure Management System | No. of Animals (Average Capacity) | Average Weight (lb) | Portion of Year Facility Is Occupied | Nitrogen Produced | | P ₂ O ₅ Produced | | K ₂ O Produced | |
|--------------------------------|--------------------------|-----------------------------------|---------------------|--------------------------------------|----------------------------|-----------|--|---|---|---------------------------|
| | | | | | Lb N / lb animal weight/yr | Lb N/year | Lb P ₂ O ₅ / lb animal weight / yr | Lb P ₂ O ₅ / year | Lb K ₂ O / lb animal weight / yr | Lb K ₂ O /year |
| Swine | | | | | | | | | | |
| Nursery (10 - 45 lb..) | | | | | 0.220 | | 0.210 | | 0.150 | |
| Grower/Finisher (45+ lb..) | 1 | 4,000 | 160 | 95% | 0.150 | 91,200 | 0.130 | 79,040 | 0.100 | 60,800 |
| Sows & Litter | | | | | 0.170 | | 0.120 | | 0.130 | |
| Sows (Gestation) | | | | | 0.070 | | 0.050 | | 0.050 | |
| Gilts | | | | | 0.088 | | 0.066 | | 0.058 | |
| Boars | | | | | 0.055 | | 0.042 | | 0.044 | |
| Other | | | | | | | | | | |
| Beef | | | | | | | | | | |
| 450-750 lb. | | | | | 0.110 | | 0.083 | | 0.088 | |
| Feeder (high energy diet) | | | | | 0.110 | | 0.078 | | 0.092 | |
| Feeder (high forage diet) | | | | | 0.110 | | 0.091 | | 0.110 | |
| Cow | | | | | 0.120 | | 0.100 | | 0.110 | |
| Other | | | | | | | | | | |
| Dairy | | | | | | | | | | |
| Cow...50 lb./day ¹ | | | | | 0.180 | | 0.087 | | 0.100 | |
| Cow...70 lb./day ¹ | | | | | 0.220 | | 0.096 | | 0.110 | |
| Cow...100 lb./day ¹ | | | | | 0.270 | | 0.110 | | 0.130 | |
| Dry Cow | | | | | 0.110 | | 0.074 | | 0.079 | |
| Heifer/Calves | | | | | 0.110 | | 0.033 | | 0.110 | |
| Other | | | | | | | | | | |
| Poultry | | | | | | | | | | |
| Layer | | | | | 0.300 | | 0.260 | | 0.150 | |
| Pullet | | | | | 0.230 | | 0.200 | | 0.110 | |
| Broiler | | | | | 0.400 | | 0.280 | | 0.200 | |
| Turkey | | | | | 0.270 | | 0.230 | | 0.120 | |
| Other | | | | | | | | | | |
| Other | | | | | | | | | | |
| Other | | | | | | | | | | |
| Other | | | | | | | | | | |
| TOTAL: | | Manure Management System | | | | | | | | |
| Book Value Table Only | | 1 Below Barn Pits | | | 91,200 | | 79,040 | | 60,800 | |
| | | 2 | | | | | | | | |
| | | 3 | | | | | | | | |
| | | 4 | | | | | | | | |
| TOTAL: | | Manure Management System | | | | | | | | |
| Sum of "Book Value" and | | 1 Below Barn Pits | | | 91,200 | | 79,040 | | 60,800 | |
| | | 2 | | | | | | | | |
| | | 3 | | | | | | | | |
| | | 4 | | | | | | | | |

1. Reference: H. H. Van Horn. 1991. Achieving Environmental Balance of Nutrient Flow Through Animal Production Systems. The Professional Animal Scientist. 7:3:22-33.

Table 2. Nutrients to be managed annually after losses from open lot, storage or lagoon.

Table 2: Nutrients to be managed annually after losses from open lot, storage or lagoon.

| Optional Storage & Treatment Systems (Place Number from Table 1 in Column "Q") | Nitrogen | | | P ₂ O ₅ | | | K ₂ O | | | |
|--|----------|------------|----------------------|-------------------------------|------------|---|------------------|------------|-------------------------------------|--------|
| | Produced | % Retained | After Losses | Produced | % Retained | After Losses | Produced | % Retained | After Losses | |
| A. Open lot or feedlot | | 60% | | | 95% | | | 70% | | |
| B. Manure pack under roof | | 70% | | | 100% | | | 100% | | |
| C. Bedded pack for swine ¹ (e.g. hoop building) | | 50% | | | 100% | | | 100% | | |
| D. Bedded pack & compost for swine ¹ (e.g. hoop building). | | 35% | | | 100% | | | 100% | | |
| E. Solid/semi-solid manure & bedding held in roofed storage | | 75% | | | 100% | | | 100% | | |
| F. Solid/semi-solid manure & bedding held in unroofed storage | | 65% | | | 95% | | | 90% | | |
| G. Liquid/slurry storage in covered storage | | 90% | | | 100% | | | 100% | | |
| H. Liquid/slurry storage in uncovered storage | | 75% | | | 100% | | | 100% | | |
| I. Storage (pit beneath slatted floor) | 1 | 91,200 | 85% | 77,520 | 79,040 | 100% | 79,040 | 60,800 | 100% | 60,800 |
| J. Poultry manure stored in pit beneath slatted floor | | 85% | | | 100% | | | 100% | | |
| K. Poultry manure on shavings or sawdust held in housing | | 70% | | | 100% | | | 100% | | |
| L. Compost | | 70% | | | 95% | | | 90% | | |
| M. 1-Cell anaerobic treatment lagoon ² | | 20% | | | 35% | | | 65% | | |
| N. Multi-cell anaerobic treatment lagoon ² | | 10% | | | 35% | | | 65% | | |
| N. Other | | | | | | | | | | |
| TOTAL | | | 77,520 lbs. N/yr. | | | 79,040 lbs. P ₂ O ₅ /yr. | | | 60,800 lbs. K ₂ O/yr. | |

Alternative values for nutrient retention can be found in Table 11-5 of NRCS Agricultural Waste Management Field Handbook.

Table 3. Phosphorus retained as settled solids or sludge by an anaerobic treatment lagoon.¹

| | Total Pounds Produced Annually (Table 1) | 1-Cell & Multiple Cell Treatment Lagoon | | |
|---|--|---|----------------------|---|
| | | Years Between Sludge Removal | % Retained in Lagoon | Total P ₂ O ₅ in settled solids |
| P ₂ O ₅ in settled solids or sludge | | | 65% | |

1. Reference: T. L. Richard. 1998. Management of Bedded Pack Manure From Swine Hoop Structures. ASAE paper no. 984127.

2. Phosphorus split between effluent (Table 2) and settled solids (Table 3) applies to an anaerobic lagoon with a permanent pool and no agitation during effluent removal.

Table 4. Remaining nitrogen after considering land application losses (ammonia volatilization losses only).

| Storage and Treatment Systems | Select Application Method? Injection/Immediate Incorporation (1), Irrigation (2), or Broadcast (3) | Days Between Application and Incorporation (Broadcast Only) | Soil Conditions: Warm Dry (1) Warm Wet (2) Cool (3) | Potentially Remaining Nitrogen in the Soil | |
|--|---|--|--|---|--------------------------------|
| | | | | % Remaining Your Preferred Value | Total Remaining (lbs./year) |
| A. Open lot or feedlot | | | | | |
| B. Manure pack under roof | | | | | |
| C. Bedded pack for swine ¹ (e.g. hoop building) | | | | | |
| D. Bedded pack & compost for swine ¹ (e.g. hoop building). | | | | | |
| E. Solid/semi-solid manure & bedding held in roofed storage | | | | | |
| F. Solid/semi-solid manure & bedding held in unroofed storage | | | | | |
| G. Liquid/slurry storage in covered storage | | | | | |
| H. Liquid/slurry storage in uncovered storage | | | | | |
| I. Storage (pit beneath slatted floor) | 1 | | | 95% | 73,644 |
| J. Poultry manure stored in pit beneath slatted floor | | | | | |
| K. Poultry manure on shavings or sawdust held in housing | | | | | |
| L. Compost | | | | | |
| M. 1-Cell anaerobic treatment lagoon ² | | | | | |
| N. Multi-cell anaerobic treatment lagoon ² | | | | | |
| N. Other | | | | User Must Estimate | |
| TOTAL | | | | | 73,644 |

Only ammonia volatilization losses are considered in this table. All organic nitrogen is assumed to be available and no denitrification losses are assumed. This procedure provides a conservative estimate of land base requirements for nitrogen. For additional information on crop availability of manure nitrogen, refer to NebGuide G97-1335-A, "Determining Crop Available Nutrients from Manure".

Source. Table 11-6 of NRCS Agricultural Waste Management Field Handbook. Ammonia volatilization losses used in spreadsheet were reduced for solid manure due to its high organic-N content. Options A, B, C, D, K, and L have been modified from NRCS table values.

1.

530 acres to utilize N

1,480 acres to utilize P

NebGuides G97-1335A-A. "Determining Crop Available Nutrients from Manure". and G95-1267-A. "Manure Applicator Calibration" for assistance in developing a nutrient budget.

**Form D-9. Agreement for Land Application of Manure**

I, John Neighbor, hereby give permission to the animal production facility owned by Joe Farmer for the application of animal manure to 225 acres of my land for the duration of the agreed upon time shown below. The land involved in this agreement is located at:

SE ¼ (south 80 acres), Section 9, Township 27, Range 4 of Pierce County

SW ¼, Section 9, Township 27, Range 4 of Pierce County

(legal description of site or sites)

Restrictions agreed upon by all parties include:

All manure must be immediately incorporated the same day as land applied

Manure application rate may not exceed 5000 gallons or 150 lbs. Of crop available nitrogen

Responsibilities of individual parties include:

| Crop nutrient management plan..... | Land Owner | Animal Producer | Other |
|--------------------------------------|--------------------------|--------------------------|--------------------------|
| Soil testing..... | X | <input type="checkbox"/> | <input type="checkbox"/> |
| Manure analysis..... | <input type="checkbox"/> | X | <input type="checkbox"/> |
| Manure applicator calibration..... | <input type="checkbox"/> | X | <input type="checkbox"/> |
| Crop nutrient status monitoring..... | X | <input type="checkbox"/> | <input type="checkbox"/> |
| Record keeping | X | X | <input type="checkbox"/> |

I understand that this manure contains organic matter, nitrogen, phosphorus, potassium, trace elements and pathogens which, if applied, at agronomic rates at appropriate times to minimize surface water runoff, should not harm my land, my crops, or waters of the state of Nebraska. I also understand that the use of animal manure will reduce my need for commercial fertilizer, that a nutrient management plan that credits manure nutrients should be implemented, and that failure to reduce commercial fertilizer use when animal manure is applied is likely to have a detrimental impact on water quality.

Term of Agreement: January 1 2001 To December 31 2021

Landowner _____ Date _____

Animal Production

Facility Owner _____

Landowner

Animal Facility Owner

Name: John Neighbor

Joe Farmer

Address: RR1 Plainview NE

RR1 Plainview, NE

Phone Number: 402-999-0001

402-999-0000

**Form B-18. Emergency Response Plan**

Purpose: Identify actions to be taken to control and mitigate a spill or discharge of animal waste. Fill out one copy of this form for each 'Cause of Discharge' that applies to the livestock operation.

Cause of Discharge (situations for which NDEQ requires Emergency Response Plan are listed below):

- ☐ Power Failure ☐ Storm/Extended Wet Period ☒ Accident
- ☐ Equipment Failure ☐ Overfilling of slurry tank or overturn of slurry tank
- ☐ Failure of berm or other facility component: _____
- ☐ Other: _____

Farm Name & Location: Case Study, RR1, Plainview, NE

In Case of an Emergency:

1. Implement the following first response or containment steps:

Use front end/skid loader on the property to move soil to create a dike to contain the flow

2. Assess the extent of the emergency and determine how much help is needed.

- a. Determine if move/larger equipment is needed to create the dike and if more people are needed to do this work
- b. Determine how much manure has spilled, how far the manure has traveled, and where it might be contained
- c. Determine if the manure has reached surface waters

3. Contact the farm's emergency response team leader:

Name: Joe Farmer

Phone: 402-999-0000

Name:

Phone:

4. Give the team leader the following information:

- Your Name • Farm Identification
- Description of emergency • Estimate of the amounts, area covered, and distance traveled.
- Has manure reached surface waters or major field drains?
- Is there any obvious damage: employee injury, fish kill, or property damage?
- What is currently in progress to contain situation?

5. Available equipment/supplies for responding to emergency:

| Equipment/supplies | Contact Person | Phone Number |
|---------------------------------|----------------|--------------|
| Front end loader | Joe Petrewski | 999-1111 |
| Mound of soils behind buildings | | |
| Vacuum Tank | Jim Dairman | 999-2322 |

6. Contacts to be made by farm's emergency response team leader (discharge must be reported to NDEQ within 24 hours):

| Organization | Contact Person | Phone Number |
|----------------|----------------|----------------|
| NDEQ | | (402) 471-2186 |
| NDEQ | ? | 402-471-286 |
| County sheriff | Wyatt Earp | 402-471-21886 |

7. Additional containment measures, corrective measures, or property restoration measures.

If near a sensitive water body contaminated surface soil will be dug up and spread on a "land application site."

8. Will written report be submitted to NDEQ? ☒ Yes ☐ No

(written report must be filed with NDEQ within 7 days)



Form C-1 (part 1). Activities Plan for Manure Application

Purpose:

This planning document summarizes the specific activities that will be implemented relative to manure application as part of the overall annual crop nutrient management plan. These activities are unlikely to change from one cropping year to the next. As such, this document only needs to be updated as the need arises. This planning document should be submitted as part of the Livestock Waste Control Facility permit application to NDEQ.

| | | |
|--|--|--------------------------------------|
| | Manure Handling System # <u>1</u> : <u>Below Barn Pits</u> | Manure Handling System # <u> </u> : |
| Priorities for fields receiving manure | Identify top one or more priorities (number in order) from list below: <u>1</u> Potential to reduce commercial fertilizer use ___ Crops with high nitrogen requirement ___ Crops with high phosphorus requirement ___ Transport distance ___ Other: _____ ___ Other: _____ | |
| Application Plan: Time of year? Method of application? Incorporation? | ___ Field's soil loss or runoff potential ___ Field's odor potential ___ Field's current phosphorus level <u>2</u> Fields benefiting from building soil organic level Late Fall: After harvest & prior to soil freezing on row crops. Early spring: After soil thaws & prior to April 1 on row crops. August: on 2nd or 3rd year alfalfa. Manure will be applied annually on row crops and as required for maintaining adequate storage on alfalfa. Slurry tanker with double disk tillage attachment and splash plate. Immediate incorporation on row crops with double disk tillage attachment. Surface application on alfalfa with splash plate. | |
| Calibration Plan ¹ : | | |
| How? When? | Procedure A: Slurry tank will be calibrated at 3 speeds, using Method 1 procedures from Neb Guide G95-1267-A. The following formula will be used: Application volume (4000 gal.) times 43560 sq. ft. per acre. divided by area covered (width of spread 10' and measured distance traveled) Procedure B: Record of loads applied to field of a known area will be used to check procedure A. See Method 4 procedures from Neb Guide G95-1267-A Procedure A: Once in spring Procedure B: F ₁₉ Spring application to each field. | |

| | | |
|--|---|--|
| Frequency? | Annually | |
| Record Keeping Plan (attach sample forms) | Records will be maintained of current and past: <input checked="" type="checkbox"/> Annual crop plans <input checked="" type="checkbox"/> Actual crop yields <input checked="" type="checkbox"/> Manure analysis <input checked="" type="checkbox"/> Soil tests <input checked="" type="checkbox"/> Manure application rates <input checked="" type="checkbox"/> Off-farm transfers of manure <input checked="" type="checkbox"/> Other: Stalk Nitrate Test | Records will be maintained of current and past: <input type="checkbox"/> Annual crop plans <input type="checkbox"/> Actual crop yields <input type="checkbox"/> Manure analysis <input type="checkbox"/> Soil tests <input type="checkbox"/> Manure application rates <input type="checkbox"/> Off-farm transfers of manure <input type="checkbox"/> Other: _____ |
| Planned Setback Distances: | Due to incorporation of manure on all row crops, no setback distances will be applied. No surface waters border or exist within the land application sites. | |

¹ These are planned procedures. The actual calibration is to be recorded separately



Form C-1 (part 2). Activities Plan for Manure Nutrient Analysis

Purpose:

This planning document summarizes the specific activities that will be implemented relative to manure analysis as part of the overall annual crop nutrient management plan. These activities are unlikely to change from one cropping year to the next. As such, this document only needs to be updated as the need arises. This planning document should be submitted as part of the LWCF permit application to NDEQ.

| | Manure Handling System # <u>1</u> : <u>Below Barn Pits</u> | Manure Handling System # <u> </u> : |
|-----------------------------------|--|---|
| Manure Sampling Frequency: | One sample will be analyzed each fall and spring from one building. Since all buildings feed program, water use, and cleanout procedures are similar, one building is representative of all. This procedure will be repeated annually. | |
| Timing of Manure Sampling: | Sample will be collected during agitation and pumpout to insure that representative sample is obtained. | |
| Sample Collection Procedures: | Eight samples will be taken as slurry tank is loaded representative of eight different depths. The eight samples will be combined, mixed, and sub-sampled for lab analysis. A one quart subsample will be sent to the lab. Sample will be frozen, insulated, and shipped to lab. | |
| Analysis to be Completed | <input checked="" type="checkbox"/> Total Nitrogen <input checked="" type="checkbox"/> Ammonium Nitrogen <input checked="" type="checkbox"/> Organic Nitrogen <input checked="" type="checkbox"/> Phosphorus <input checked="" type="checkbox"/> Potassium <input checked="" type="checkbox"/> Trace Minerals <input checked="" type="checkbox"/> Moisture or solids content <input checked="" type="checkbox"/> pH <input checked="" type="checkbox"/> Electrical conductivity <input type="checkbox"/> Other: _____ | <input type="checkbox"/> Total Nitrogen <input type="checkbox"/> Ammonium Nitrogen <input type="checkbox"/> Organic Nitrogen <input type="checkbox"/> Phosphorus <input type="checkbox"/> Potassium <input type="checkbox"/> Trace Minerals <input type="checkbox"/> Moisture or solids content <input type="checkbox"/> pH <input type="checkbox"/> Electrical conductivity <input type="checkbox"/> Other: _____ |
| Other: (e.g. Laboratory used) | Northeast Labs in Norfolk, Nebraska | |



Form C-1 (part 3). Activities Plan for Soil Testing

Purpose:

This planning document summarizes the specific activities that will be implemented relative to soil sampling and analysis as part of the overall annual crop nutrient management plan. These activities are unlikely to change from one cropping year to the next. As such, this document only needs to be updated as the need arises. This planning document should be submitted as part of the LWCF permit application to NDEQ.

| | General Plan: Crops Pivot #1 Approx. acres: 130 | Pivot #2 Approx. acres: 130 | Alfalfa Approx. acres: 45 |
|--|---|--|---|
| Frequency and Timing of Soil Sampling for N & P | Fall, deep soil sampling for N Spring PSNT | <i>Same</i> | <i>Same</i> |
| Sampling Procedures for N & P: (e.g. no. of cores / area, depth, acres / sample area, etc.) | <i>Sample BoA, ThC, OrC, BdA separately</i> 10 cores per sample 0-6" 6-24" 24-48" | Sample by quarter: NE ¼ SE ¼ NW ¼ NE 1/4 | <i>Each Corner with Alfalfa</i> |
| Sample Analysis Procedures for N & P: | 0-6" OM, NO ₃ -N, P (Bray#1), K, pH 6-24" Nitrate only 24-48" Nitrate only | <i>Same</i> | <i>Surface sample only</i> |
| Nitrogen Recommendation Calculation, Phosphorus Recommendation | UNL recommendation: 5 year average plus 5% P supplied by manure | <i>Same</i> | N applied if land needed, use 50% of alfalfa removal at 3 tons/acre |

Additional Crop Nutrient Status Measurements

(e.g. other soil nitrate tests, irrigation water tests, chlorophyll meter readings, corn stalk nitrate test, etc.).

| Test: | Irrigation Well | PSNT | Stalk Nitrate | |
|--------------------------------|-----------------------------|---|---|--|
| Use and Timing of Measurement. | Sample for nitrate annually | Sample in areas listed above May 30, every year | Sample above until stalk nitrates get below 2000 than one field each year | |



Form C-2. Crop Available Manure Nitrogen & Form C-3. Annual Nitrogen Management Plan

Forms C-2 (Crop Available Manure Nitrogen) and C-3 (Annual Nitrogen Management Plan) are provided as examples of the procedure that will be used for estimating crop nitrogen balance and rate of manure application for attaining this balance. Because all manure sampling and soils analysis reports are not available at the time of the permit application, the best available historical data is used for estimating nitrogen balance and manure application rate for year 2001. These reports will be updated as final soils reports and manure analysis reports become available for this year.

In addition, Forms C-2 (Crop Available Manure Nitrogen) and C-3 (Annual Nitrogen Management Plan) will be undated each year as new soils reports and manure analysis becomes available.



Form C-2. Crop Available Manure Nitrogen

| Manure Application Options | | | | Ammonium-N Available This Year | | | Organic-N Available This Year | | | j. Total N Avail- able (1 st yr.) (f + i) | Organic-N Available: | | |
|----------------------------|---|---|--|--------------------------------|--|--|-------------------------------|--|--|--|---|---|--|
| a. Option # | b. Manure Source, Season of Application, & Incorporation | c. Planned Application Rate | d. N Content | e. Avail- able Factor | f. Avail- able N (c X d X e) (lbs./ac.) | g. N Content | h. Avail- able Factor | i. Avail-able N (c X g X h) (lbs./ac.) | k. Next Year (i x 0.5) (lbs./ac) | | l. 2 Years From Now (i x 0.25) (lbs./ac.) | m. 3 years From Now (i x 0.12) (lbs./ac) | |
| 1 | Feedlot manure, surface applied, incorporate in 24 hrs. | 20 <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | 4 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.5 | 40 | 16 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.25 | 80 | 120 | 40 | 20 | 10 | |
| 2 | Below Barn Pits: Late Fall, No Incorp | 3 <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | 27 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0 | 0 | 10 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 10.5 | 10.5 | 5 | 2 | | |
| 3 | Below Barn Pits: Late Fall, No Incorp | 6 <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | 27 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0 | | 10 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 21 | 21 | 10.5 | 5 | | |
| 4 | Below Barn Pits: Spring, Incorp. Immediately | 3 <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | 27 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.95 | 77 | 10 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 10.5 | 78 | 5 | 2 | | |
| 5 | Below Barn Pits: Spring, Incorp. Immediately | 6 <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | 27 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.95 | 154 | 10 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 21 | 175 | 10.5 | 5 | | |
| 6 | Below Barn Pits: Spring, Incorp. 3 days latter | 3 <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | 27 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 28 | 10 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 10.5 | 38.5 | 5 | 2 | | |
| 7 | Below Barn Pits: Spring, Incorp. 3 days latter | 6 <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | 27 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 57 | 10 <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | 0.35 | 21 | 78 | 10.5 | 5 | | |
| 8 | | <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | | | <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | | | | | | | |
| 9 | | <input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac | <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | | | <input type="checkbox"/> Lbs./ton <input type="checkbox"/> Lbs./1000 gal <input type="checkbox"/> Lbs./ac-in | | | | | | | |



Form C-3 . Annual Nitrogen Management Plan:

Complete the line for the next year before applying any manure.

Field or Management Area: Pivot Corners

Organic Matter: Yr.: , %: ; Yr.: , %: .

If irrigated: Acre-inches / year (for col. h): NO₃-N conc. of irrigation water: Yr.: ppm: ; Yr.: ppm: .

| a. Year | b. Previous Crop | c. Planned Crop | d. Expect- ed Yield (E.Y.) bu./ac., Tons/ac., lb./ac. (Avg. x 1.05) | e. Soil Test Nitrate-N (average ppm) | f. Total Nitrogen need or removal (lbs/acre) | Nitrogen Credits (lbs./acre) | | | j. Fertilizer nitrogen credit (starter, etc.) (lbs./ac.) | k.Net nitrogen need before manure application (f - g - h - i - j) (lbs.N/ac.) | l. Manure Applic. Option (write line no. from Form C- 2, col. a) | m. Planned Manure Applica- tion Rate (C-2, col. c) (T./ac, gal./ac, or in./ac.) | n. Rate of Manure Nitrogen Available (Form C-2, col. j) (lbs.N/ac.) | o. Extra nitrogen needed as fertilizer (k - n) (lb. N./ac.) |
|------------|------------------------|-----------------------|---|--|---|--|--|--|--|---|--|---|--|---|
| | | | | | | g. Manure N from past years (lbs./ac.) | h. Irrigation water N (ppm x 0.227 x Ac.-in.) (lbs./ac.) | i. Legume / green man. N (Ref. Table F-13) (lbs./ac.) | | | | | | |
| 2001 | Soybeans | Corn | 170 | 3 ppm | 167 at 2% OM | 11 | (10 ppm) 20 lb/ac | 45 | 6 | 85 | Ex | 18 T./ac. | 90 | 0 lb/ac |
| 2001 | Alfalfa | Alfalfa | 3 t/ac | --- | 67 | 0 | 0 | 0 | 0 | 67 | 3 | 6,000 g/a | 21 | -- |
| | | | | | | | | | | | | | | |
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Form C-3 . Annual Nitrogen Management Plan:

25

Complete the line for the next year before applying any manure.

Field or Management Area: Pivot 1

Organic Matter: Yr.: 2000, 1.6%: Yr.: , %: .

If irrigated: Acre-inches / year (for col. h): 6 NO₃-N conc. of irrigation water: Yr.: 10 ppm: ; Yr.: ppm: .

Case Study June 2001

| a. Year | b. Previous Crop | c. Planned Crop | d. Expect- ed Yield (E.Y.) bu./ac., Tons/ac., lb./ac. (Avg. x 1.05) | e. Soil Test Nitrate-N (average ppm) | f. Total Nitrogen need or removal (lbs/acre) | Nitrogen Credits (lbs./acre) | | | j. Fertilizer nitrogen credit (starter, etc.) (lbs./ac.) | k.Net nitrogen need before manure application (f - g - h - i - j) (lbs.N/ac.) | l. Manure Applic. Option (write line no. from Form C- 2, col. a) | m. Planned Manure Applica- tion Rate (C-2, col. c) (T./ac, gal./ac, or in./ac.) | n. Rate of Manure Nitrogen Available (Form C-2, col. j) (lbs.N/ac.) | o. Extra nitrogen needed as fertilizer (k - n) (lb. N./ac.) |
|------------|------------------------|-----------------------|---|--|---|--|--|--|--|---|--|---|--|---|
| | | | | | | g. Manure N from past years (lbs./ac.) | h. Irrigation water N (ppm x 0.227 x Ac.-in.) (lbs./ac.) | i. Legume / green man. N (Ref. Table F-13) (lbs./ac.) | | | | | | |
| 2001 | Soybeans | Corn | 170 | 3 ppm | 167 at 2% OM | 11 | (10 ppm) 20 lb/ac | 45 | 6 | 85 | Ex | 18 T./ac. | 90 | 0 lb/ac |
| 2001 | Corn | Corn | 178 | 3.3 | 185 | 15 | 14 | 0 | 0 | 156 | 5 | 6000 g/a | 175 | 0 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
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Form C-3 . Annual Nitrogen Management Plan:

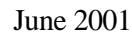
Complete the line for the next year before applying any manure.

Field or Management Area: Pivot 2

Organic Matter: Yr.: 2000, 2.4 % ; Yr.: , %: .

If irrigated: Acre-inches / year (for col. h): NO₃-N conc. of irrigation water: Yr.: ppm: ; Yr.: ppm: .

| a. Year | b. Previous Crop | c. Planned Crop | d. Expect- ed Yield (E.Y.) bu./ac., Tons/ac., lb./ac. (Avg. x 1.05) | e. Soil Test Nitrate-N (average ppm) | f. Total Nitrogen need or removal (lbs/acre) | Nitrogen Credits (lbs./acre) | | | j. Fertilizer nitrogen credit (starter, etc.) (lbs./ac.) | k.Net nitrogen need before manure application (f - g - h - i - j) (lbs.N/ac.) | l. Manure Applic. Option (write line no. from Form C- 2, col. a) | m. Planned Manure Applica- tion Rate (C-2, col. c) (T./ac, gal./ac, or in./ac.) | n. Rate of Manure Nitrogen Available (Form C-2, col. j) (lbs.N/ac.) | o. Extra nitrogen needed as fertilizer (k - n) (lb. N./ac.) |
|------------|------------------------|-----------------------|---|--|---|--|--|--|--|---|--|---|--|---|
| | | | | | | g. Manure N from past years (lbs./ac.) | h. Irrigation water N (ppm x 0.227 x Ac.-in.) (lbs./ac.) | i. Legume / green man. N (Ref. Table F-13) (lbs./ac.) | | | | | | |
| 2001 | Soybeans | Corn | 170 | 3 ppm | 167 at 2% OM | 11 | (10 ppm) 20 lb/ac | 45 | 6 | 85 | Ex | 18 T./ac. | 90 | 0 lb/ac |
| 2000 | Corn | Corn | 178 | 3 | 165 | 15 | 0 | 0 | 10 | 140 | 7 | 6000 | 102 | 40 lb/ac |
| | | | | | | | | | | | | | | |
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Form D-2. Additional Crop, Soil, and Water Nutrient Status Indicators

Instructions: Record any information listed below that may provide insight as to the nutrient status of the crop.

[illegible]

Instructions: Summarize any available water quality measurements.

[illegible]

1. Nitrate, ammonium, or coliform bacteria can be measured to provide an indication of contamination by fertilizer and/or manure.

Form D-3. Continuing Education Summary

[illegible]



Case Study

June 2001

NDEQ Title 130 requires the owner's attendance of an approved land application educational program every 5 years

Form D-6. Slurry or Sludge Application Field Record

Farm Owner: _____ Livestock/Poultry Facility: _____ Year: _____

Manure Applicator: _____ Net Load Capacity: _____ gallons

| Date | Field ID | Number of Loads | Is Storage Agitated During Pump Out? | Is Manure Incorporated into Soil? | Area Covered (acres) | Wind Direction from: | Set backs maintained | Soil/Field Conditions | Operator Initials |
|--------|----------|-----------------|--|--|----------------------|----------------------|----------------------|--|-------------------|
| Sample | Pivot 1 | /// // / | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input checked="" type="checkbox"/> No | 8 acre | SE | 30' from stream | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input checked="" type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |

Case Study

June 2001

| | | | | | | | | | |
|---|--|--|---|---|------|--|--|---|--|
| | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes, <input type="text"/> days later <input type="checkbox"/> No | acre | | | <input type="checkbox"/> Frozen <input type="checkbox"/> Snow-covered <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry | |
| The minimum distance between the manure application area and any stream, lake, wells, impounded waters or wetlands was <input type="text"/> feet. | | | | | | | | | |

Case Study

June 2001

Laboratories, Inc.
Ag Testing - Consulting

53070
Ebel, Marie
Holt County Groundwater Education
301 North Harrison
2000
O'Neill, NE 68763
2000

Slurry Report

Invoice Number: 664962
Date Received: March 16,
Date Reported: March 17,

Results For: Swine Finishing Barn
Lab Number: 142

Sample ID: 4
3-14-00

| | Analysis As Received | Total Lbs per Acre Inch | Total Lbs per 1000 gal | Amount Available First Year | |
|-------------------------|----------------------------|-------------------------------|------------------------------|--------------------------------|---------------------------|
| | | | | Lbs per Acre Inch | Lbs per 1000 gal |
| ORGANIC NITROGEN, ppm N | 1201.6 | 272.4 | 10.1 | 54.5 | 2.0 |
| AMMONIUM, ppm N | 3242.3 | 734.9 | 27.2 | 734.9 | 27.2 |
| NITRATE, ppm N | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTAL N (TKN), ppm N | 4444.0 | 1007.3 | 37.3 | 769.4 | 29.2 |
| PHOSPHORUS, ppm P205 | 5147.6 | 1166.8 | 43.2 | 583.4 | 21.6 |
| POTASSIUM, ppm K20 | 2527.7 | 573.0 | 21.2 | 573.0 | 21.2 |
| SULFUR, ppm S | 512.1 | 116.1 | 4.3 | 58.0 | 2.1 |
| CALCIUM, ppm Ca | 2560.9 | 560.5 | 21.5 | 290.2 | 10.7 |
| MAGNESIUM, ppm Mg | 1002.8 | 227.3 | 8.4 | 113.7 | 4.2 |
| SODIUM, ppm Ne | 425.8 | 96.5 | 3.6 | 96.5 | 3.6 |
| ZINC, ppm Zn | 79.03 | 17.91 | 0.66 | 8.96 | 0.33 |
| IRON, ppm Fe | 143.89 | 32.62 | 1.21 | 16.31 | 0.60 |
| MANGANESE, ppm Mn | 14.79 | 3.35 | 0.12 | 1.68 | 0.06 |
| COPPER, ppm Cu | 18.75 | 4.25 | 0.16 | 2.13 | 0.08 |
| BORON, ppm B | 6.53 | 1.48 | 0.05 | 1.48 | 0.05 |
| CHLORIDE, ppm Cl | 1425.00 | 323.00 | 11.95 | 323.00 | 11.96 |
| SOLUBLE SALTS, mmho/cm | 17.70 | 2407 | 89 | 2407 | 89 |
| pH | 6.8 | | | | |
| DRY MATTER, % | 8.54 | | | | |
| ASH, % | | | | | |
| ORGANIC MATTER, % | 8.54 | | | | |
| ORGANIC CARBON, % | 4.95 | | | | |
| C:N RATIO | 11.1 | | | | |



SOIL TEST PROGRAM

Submitted by:
CNMP Case Study
Section 16, North half
Plainview, USA
-

Sample: Piv1 Lab No: - Date Rcvd: - County: PIERCE

IRRIGATION WATER 5 year avg water applied: 8.0 in
NO3-N content irr. water: 0.0 ppm NO3-N contr. irr. water: 0 lb/a
SO4-S content irr. water: 0.0 ppm

NITROGEN IN DEPTH SAMPLED NITRATE-NITROGEN ANALYSIS, by depth in inches
36 lb/a 9.3 ppm(0- 8) 2.4 ppm(8-24) 0.6 ppm(24-36)
3.3 avg ppm

| | | | | |
|----------------|-----------|---|------|----------|
| Soil pH | 5.5 | FERTILIZER SUGGESTIONS in pounds per acre | | |
| BpH (Woodruff) | 6.7 | | | |
| BpH (SMP) | - | Previous Crop | CORN | |
| Excess Lime | - | Your Choice | 1 | 2 3 |
| Lime Need | 3000 lb/a | Crop | CORN | |
| Organic Matter | 1.6 % | Expected Yield | 180 | BU |
| Texture | - | NITROGEN | 185 | |
| Bray-1 P, ppm | 134 VHI | PHOSPHORUS Row | 0 | OR |
| | | Bdct | 0 | |
| Potassium, ppm | 534 VHI | POTASSIUM Row | 0 | |
| | | Bdct | 0 | |

When the soil pH is less than 6.3 a lime requirement test (Buffer pH) is made to determine how much 60% effective ag lime is needed to increase the soil pH to about 6.5. When pH is less than 5.7, an economic return from lime is expected over an 8 to 10 year period.

Your nitrogen (N) recommendations are based on the residual nitrate-nitrogen found in the deep and surface soil samples. The recommended fertilizer N plus residual soil nitrate should provide adequate N for the expected yield. If spring rains are excessive an additional 40 pounds of N may be needed.

Suggested NITROGEN rate has been REDUCED based on the contribution of irrigation water.

Fertilizer recommendations for phosphorus on corn are based on potential grain yield increases. Faster early growth may occur at high and medium soil phosphorus levels when starter fertilizer (row) is used especially for early planted corn. See Nebguide G74-174 and G77-361 for additional information.



COOPERATIVE EXTENSION
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA



SOIL TEST PROGRAM

Submitted by:
CNMP Case Study
Section 16, North half
Plainview, USA
-

Sample: Piv2 Lab No: - Date Rcvd: - County: PIERCE

IRRIGATION WATER 5 year avg water applied: 8.0 in
NO3-N content irr. water: 2.0 ppm NO3-N contr. irr. water: 4 lb/a
SO4-S content irr. water: 0.0 ppm

NITROGEN IN DEPTH SAMPLED NITRATE-NITROGEN ANALYSIS, by depth in inches
22 lb/a 2.7 ppm(0- 8) 2.0 ppm(8-24) 1.7 ppm(24-36)
2.1 avg ppm

| | | | | |
|----------------|-----------|---|------|----------|
| Soil pH | 5.7 | FERTILIZER SUGGESTIONS in pounds per acre | | |
| BpH (Woodruff) | 6.8 | | | |
| BpH (SMP) | - | Previous Crop | CORN | |
| Excess Lime | - | Your Choice | 1 | 2 3 |
| Lime Need | 2000 lb/a | Crop | CORN | |
| Organic Matter | 2.4 % | Expected Yield | 180 | BU |
| Texture | - | NITROGEN | 170 | |
| Bray-1 P, ppm | 8.7 LOW | PHOSPHORUS Row | 20 | OR |
| | | Bdct | 40 | |
| Potassium, ppm | 216 VHI | POTASSIUM Row | 0 | |
| | | Bdct | 0 | |

When the soil pH is less than 6.3 a lime requirement test (Buffer pH) is made to determine how much 60% effective ag lime is needed to increase the soil pH to about 6.5. When pH is less than 5.7, an economic return from lime is expected over an 8 to 10 year period.

Your nitrogen (N) recommendations are based on the residual nitrate-nitrogen found in the deep and surface soil samples. The recommended fertilizer N plus residual soil nitrate should provide adequate N for the expected yield. If spring rains are excessive an additional 40 pounds of N may be needed.

Suggested NITROGEN rate has been REDUCED based on the contribution of irrigation water.

Fertilizer recommendations for phosphorus on corn are based on potential grain yield increases. Faster early growth may occur at high and medium soil phosphorus levels when starter fertilizer (row) is used especially for early planted corn. See Nebguide G74-174 and G77-361 for additional information.



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INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA



SOIL TEST PROGRAM

Submitted by:
CNMP Case Study
Section 16, North half
Plainview, USA
-

Sample: dry Lab No: 1 Date Rcvd: - County: PIERCE

NITROGEN IN DEPTH SAMPLED NITRATE-NITROGEN ANALYSIS, by depth in inches
14 lb/a 1.0 ppm(0- 8) 2.0 ppm(8-24) 0.6 ppm(24-36)
1.3 avg ppm

| | | | | |
|----------------|-----------|---|---------|----------|
| Soil pH | 5.5 | FERTILIZER SUGGESTIONS in pounds per acre | | |
| BpH (Woodruff) | 6.7 | | | |
| BpH (SMP) | - | Previous Crop | ALFALFA | |
| Excess Lime | - | Your Choice | 1 | 2 3 |
| Lime Need | 3000 lb/a | Crop | ALFALFA | |
| Organic Matter | 1.0 % | Expected Yield | 3 TON | |
| Texture | - | NITROGEN | | |
| Bray-1 P, ppm | 15 LOW | PHOSPHORUS | Row | |
| | | | Bdct | 30 |
| Potassium, ppm | 80 MED | POTASSIUM | Row | |
| | | | Bdct | 40 |

Lime may be needed for top alfalfa yields when the pH is below 6.3 especially on sandy soils. The lime should be incorporated into the soil to a depth of 6 to 7 inches at a rate to meet the lime requirement. The lime requirement is based on ag lime that is 60 percent effective calcium carbonate (ECC). The rate should be adjusted if the liming material is less than 55% EC or greater than 65% or if it will be incorporated to a different depth.

The surface soils for certain soil types in northeast and central Nebraska may be moderately to strongly acid, but subsoils are neutral or calcareous. Alfalfa can be established and may not benefit from using lime on these soils. Testing the pH of these soils at 18 to 24 inches is recommended before liming.

Topdressing established stands of non-irrigated alfalfa may be profitable when the soiltest for phosphorus is low or very low. Response will then depend on available soil moisture and stand.